



SEQUENCE LISTING

<110> UNIVERSITY OF SOUTHERN CALIFORNIA
Markland, Francis S.
Ritter, Matthew

<120> CONTORTROSTATIN (CN) AND METHODS FOR ITS USE IN PREVENTING METASTASIS
AND OTHER CONDITIONS

<130> 1279-338N3/09801388

<140> Not yet assigned
<141> 2003-11-12

<150> US09/591,552
<151> 2000-06-08

<150> US 08/141,321
<151> 1993-10-22

<150> US 08/540,423
<151> 1995-10-10

<150> US 08/632,691
<151> 1996-04-15

<150> US 08/745,603
<151> 1996-11-08

<150> US 09/163,047
<151> 1998-09-29

<150> US09/460,295
<151> 1999-12-10

<160> 15

<170> PatentIn version 3.1

<210> 1
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<212> DNA
<213> Agkistrodon contortrix

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<212> PRT
<213> Agkistrodon contortrix

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Val Leu Tyr Pro Gln Lys Val Thr Ala Leu Pro Lys Gly Ala Val Gln
35 40 45

Pro Lys Tyr Glu Asp Thr Met Gln Tyr Glu Phe Lys Val Asn Gly Glu
50 55 60

Pro Val Val Leu His Leu Glu Lys Asn Lys Gly Leu Phe Ser Lys Asp
65 70 75 80

Tyr Ser Glu Thr His Tyr Ser Ser Asp Gly Arg Lys Ile Thr Thr Asn
85 90 95

Pro Pro Val Glu Asp His Cys Tyr Tyr His Gly Arg Ile Gln Asn Asp
100 105 110

Ala Asp Ser Thr Ala Ser Ile Ser Ala Cys Asn Gly Leu Lys Gly His
115 120 125

Phe Lys Leu Gln Gly Glu Thr Tyr Leu Ile Glu Pro Leu Lys Leu Ser
130 135 140

Asp Ser Glu Ala His Ala Val Tyr Lys Tyr Glu Asn Val Glu Lys Glu
145 150 155 160

Asp Glu Ala Pro Lys Met Cys Gly Val Thr Gln Thr Asn Trp Glu Ser
165 170 175

Asp Glu Pro Ile Lys Lys Ala Ser Gln Leu Asn Leu Thr Pro Glu Gln
180 185 190

Gln Gly Phe Pro Gln Arg Tyr Ile Glu Leu Val Val Ala Asp His
195 200 205

Arg Met Phe Thr Lys Tyr Asn Gly Asn Leu Asn Thr Ile Arg Ile Trp
210 215 220

Val His Glu Leu Val Asn Thr Met Asn Val Phe Tyr Arg Pro Leu Asn
225 230 235 240

Ile Arg Val Ser Leu Thr Asp Leu Glu Val Trp Ser Asp Gln Asp Leu
245 250 255

Ile Asn Val Gln Pro Ala Ala Ala Asp Thr Leu Glu Ala Phe Gly Asp
260 265 270

Trp Arg Glu Thr Val Leu Leu Asn Arg Ile Ser His Asp Asn Ala Gln
275 280 285

Leu Leu Thr Ala Ile Glu Leu Asp Gly Glu Thr Ile Gly Leu Ala Asn
290 295 300

Arg Gly Thr Met Cys Asp Pro Lys Leu Ser Thr Gly Ile Val Gln Asp
305 310 315 320

His Ser Ala Ile Asn Leu Trp Val Ala Val Thr Met Ala His Glu Met
325 330 335

Gly His Asn Leu Gly Ile Ser His Asp Gly Asn Gln Cys His Cys Asp
340 345 350

Ala Asn Ser Cys Ile Met Ser Glu Glu Leu Arg Glu Gln Leu Ser Phe
355 360 365

Glu Phe Ser Asp Cys Ser Gln Asn Gln Tyr Gln Thr Tyr Leu Thr Asp
370 375 380

His Asn Pro Gln Cys Met Leu Asn Glu Pro Leu Arg Thr Asp Ile Val
385 390 395 400

Ser Thr Pro Val Ser Gly Asn Glu Leu Leu Glu Thr Gly Glu Glu Ser
405 410 415

Asp Phe Asp Ala Pro Ala Asn Pro Cys Cys Asp Ala Ala Thr Cys Lys
420 425 430

Leu Thr Thr Gly Ser Gln Cys Ala Asp Gly Leu Cys Cys Asp Gln Cys
435 440 445

Lys Phe Met Lys Glu Gly Thr Val Cys Arg Arg Ala Arg Gly Asp Asp
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Leu Asp Asp Tyr Cys Asn Gly Ile Ser Ala Gly Cys Pro Arg Asn Pro
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Phe His Ala

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<213> Trimeresurus gramineus

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<211> 21
<212> DNA
<213> Trimeresurus gramineus

<400> 4
gcgatgctgc aacctgtaaa c 21

<210> 5
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<212> DNA
<213> Bacteriophage lambda

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gcgatgctgc aacctgtaaa c 21

<210> 6
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<211> 71
<212> PRT
<213> Agkistrodon piscivorus

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Asp Ala Ala Thr Cys Lys Leu Arg Pro Gly Ala Gln Cys Ala Glu Gly
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Leu Cys Cys Asp Gln Cys Lys Phe Met Lys Glu Gly Thr Val Cys Arg
35 40 45

Ala Arg Gly Asp Asp Val Asn Asp Tyr Cys Asn Gly Ile Ser Ala Gly
50 55 60

Cys Pro Arg Asn Pro Phe His
65 70

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<211> 552
<212> PRT
<213> Trimeresurus gramineus

<400> 8

Glu Ala Gly Glu Asp Cys Asp Cys Gly Ser Pro Ala Asn Pro Cys Cys
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Asp Ala Ala Thr Cys Lys Leu Ile Pro Gly Ala Gln Cys Gly Glu Gly
20 25 30

Leu Cys Cys Asp Gln Cys Ser Phe Ile Glu Glu Gly Thr Val Cys Arg
35 40 45

Ile Ala Arg Gly Asp Asp Leu Asp Asp Tyr Cys Asn Gly Arg Ser Ala
50 55 60

Gly Cys Pro Arg Asn Pro Phe His Met Ile Gln Val Leu Leu Ile Thr
65 70 75 80

Ile Cys Leu Ala Val Phe Pro Tyr Gln Gly Ser Ser Ile Ile Leu Glu
85 90 95

Ser Gly Asn Leu Asn Asp Tyr Glu Val Val Tyr Pro Glu Lys Val Thr
100 105 110

Ala Leu Pro Lys Gly Ala Val Gln Gln Lys Tyr Glu Asp Ala Met Gln
115 120 125

Tyr Glu Phe Lys Val Asn Gly Glu Pro Val Val Leu His Leu Glu Lys
130 135 140

Asn Lys Gly Leu Phe Ser Glu Asp Tyr Ser Glu Ile His Tyr Ser Pro
145 150 155 160

Asp Gly Arg Glu Ile Thr Ala Tyr Pro Ser Val Glu Asp His Cys Tyr
165 170 175

Tyr His Gly Arg Ile Glu Asn Asp Ala Asp Ser Thr Ala Ser Ile Ser
180 185 190

Ala Cys Asp Gly Leu Lys Gly His Phe Lys Leu Gln Gly Glu Met Tyr
195 200 205

Leu Ile Glu Pro Leu Glu Leu Ser Asp Ser Glu Ala His Ala Val Phe
210 215 220

Lys Tyr Glu Asn Val Glu Lys Glu Asp Glu Pro Pro Lys Met Cys Gly
225 230 235 240

Val Thr Gln Asn Trp Glu Ser Tyr Glu Ser Thr Lys Lys Ala Ser Gln
245 250 255

Leu Asn Val Thr Pro Glu Gln Gln Arg Phe Pro Gln Arg Tyr Ile Lys
260 265 270

Leu Gly Ile Phe Val Asp His Gly Met Tyr Thr Lys Tyr Ser Gly Asn
275 280 285

Ser Glu Arg Ile Thr Lys Arg Val His Gln Met Ile Asn Asn Ile Asn
290 295 300

Met Met Cys Arg Ala Leu Asn Ile Val Thr Thr Leu Ser Val Leu Glu
305 310 315 320

Ile Trp Ser Glu Lys Asp Leu Ile Thr Val Gln Ala Ser Ala Pro Thr
325 330 335

Thr Leu Thr Leu Phe Gly Ala Trp Arg Glu Thr Val Leu Leu Asn Arg
340 345 350

Thr Ser His Asp His Ala Gln Leu Leu Thr Ala Thr Ile Phe Asn Gly
355 360 365

Asn Val Ile Gly Arg Ala Pro Val Gly Gly Met Cys Asp Pro Lys Arg
370 375 380

Ser Val Ala Ile Val Arg Asp His Asn Ala Ile Val Phe Val Val Ala
385 390 395 400

Val Thr Met Thr His Glu Met Gly His Asn Leu Gly Met His His Asp
405 410 415

Glu Asp Lys Cys Asn Cys Asn Thr Cys Ile Met Ser Lys Val Leu Ser
420 425 430

Arg Gln Pro Ser Lys Tyr Phe Ser Glu Cys Ser Lys Asp Tyr Tyr Gln
435 440 445

Thr Phe Leu Thr Asn His Asn Pro Gln Cys Ile Leu Asn Ala Pro Leu
450 455 460

Arg Thr Asp Thr Val Ser Thr Pro Val Ser Gly Asn Glu Leu Leu Glu
465 470 475 480

Ala Gly Glu Asp Cys Asp Cys Gly Ser Pro Ala Asn Pro Cys Cys Asp
485 490 495

Ala Ala Thr Cys Lys Leu Ile Pro Gly Ala Gln Cys Gly Glu Gly Leu
500 505 510

Cys Cys Asp Gln Cys Ser Phe Ile Glu Glu Gly Thr Val Cys Arg Ile
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530 535 540

Cys Pro Arg Asn Pro Phe His Ala
545 550

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<213> Trimeresurus albolabris

<400> 9

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Asp Ala Ala Thr Cys Lys Leu Leu Pro Gly Ala Gln Cys Gly Glu Gly
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Leu Cys Cys Asp Gln Cys Ser Phe Met Lys Lys Gly Thr Ile Cys Arg
35 40 45

Arg Ala Arg Gly Asp Asp Leu Asp Asp Tyr Cys Asn Gly Ile Ser Ala
50 55 60

Gly Cys Pro Arg Asn Pro Leu His Ala
65 70

<210> 10
<211> 73
<212> PRT
<213> Trimeresurus elegans

<400> 10

Glu Ala Gly Glu Glu Cys Asp Cys Gly Ser Pro Glu Asn Pro Cys Cys
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Asp Ala Ala Thr Cys Lys Leu Arg Pro Gly Ala Gln Cys Ala Asp Gly
20 25 30

Leu Cys Cys Asp Gln Cys Arg Phe Lys Lys Lys Arg Thr Ile Cys Arg
35 40 45

Arg Ala Arg Gly Asp Asn Pro Asp Asp Arg Cys Thr Gly Gln Ser Ala
50 55 60

Asp Cys Pro Arg Asn Gly Leu Tyr Ser
65 70

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<212> PRT
<213> Calloselasma rhodostoma

<400> 11

Gly Lys Glu Cys Asp Cys Ser Ser Pro Glu Asn Pro Cys Cys Asp Ala
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Ala Thr Cys Lys Leu Arg Pro Gly Ala Gln Cys Gly Glu Gly Leu Cys
20 25 30

Cys Glu Gln Cys Lys Phe Asp Arg Ala Gly Lys Ile Cys Arg Ile Pro
35 40 45

Arg Gly Asp Met Pro Asp Asp Arg Cys Thr Gly Gln Ser Ala Asp Cys
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Pro Arg Tyr His
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<210> 12

<211> 606

<212> PRT

<213> Crotalus atrox

<400> 12

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20 25 30

Val Ile Tyr Pro Arg Lys Val Thr Ala Leu Pro Lys Gly Ala Val Gln
35 40 45

Pro Lys Tyr Glu Asp Ala Met Gln Tyr Glu Leu Lys Val Asn Gly Glu
50 55 60

Pro Val Val Leu His Leu Gly Lys Asn Lys Gly Leu Phe Ser Lys Asp
65 70 75 80

Tyr Ser Glu Thr His Tyr Ser Pro Asp Gly Arg Glu Ile Thr Thr Tyr
85 90 95

Pro Leu Val Glu Asp His Cys Tyr Tyr His Gly Ile Glu Asn Asp Ala
100 105 110

Asp Ser Thr Ala Ser Ile Ser Ala Cys Asn Gly Leu Lys Gly His Phe
115 120 125

Lys Leu Gln Gly Glu Met Tyr Leu Ile Glu Pro Leu Lys Leu Pro Asp
130 135 140

Ser Glu Ala His Ala Val Tyr Lys Tyr Glu Asn Val Glu Lys Glu Asp
145 150 155 160

Glu Ala Leu Lys Met Cys Gly Val Thr Gln Asn Trp Glu Ser Tyr Glu
165 170 175

Pro Ile Lys Lys Ala Ser Gln Leu Val Val Thr Ala Glu His Gln Lys
180 185 190

Tyr Asn Pro Phe Arg Phe Val Glu Leu Phe Leu Val Val Asp Lys Ala
195 200 205

Met Val Thr Lys Asn Asn Gly Asp Leu Asp Lys Ile Lys Thr Arg Met
210 215 220

Tyr Glu Ile Val Asn Thr Val Asn Glu Ile Tyr Arg Tyr Met Tyr Ile
225 230 235 240

His Val Ala Leu Val Gly Leu Glu Ile Trp Ser Asn Glu Asp Lys Ile
245 250 255

Thr Val Lys Pro Glu Ala Gly Tyr Thr Leu Asn Ala Phe Gly Glu Trp
260 265 270

Arg Lys Thr Asp Leu Leu Thr Arg Lys Lys His Asp Asn Ala Gln Leu
275 280 285

Leu Thr Ala Ile Asp Leu Asp Arg Val Ile Gly Leu Ala Tyr Val Gly
290 295 300

Ser Met Cys His Pro Lys Arg Ser Thr Gly Ile Ile Gln Asp Tyr Ser
305 310 315 320

Glu Ile Asn Leu Val Val Ala Val Ile Met Ala His Glu Met Gly His
325 330 335

Asn Leu Gly Ile Asn His Asp Ser Gly Tyr Cys Ser Cys Gly Asp Tyr
340 345 350

Ala Cys Ile Met Arg Pro Glu Ile Ser Pro Glu Pro Ser Thr Phe Phe
355 360 365

Ser Asn Cys Ser Tyr Phe Glu Cys Trp Asp Phe Ile Met Asn His Asn
370 375 380

Pro Glu Cys Ile Leu Asn Glu Pro Leu Gly Thr Asp Ile Ile Ser Pro
385 390 395 400

Pro Val Cys Gly Asn Glu Leu Leu Glu Val Gly Glu Glu Cys Asp Cys
405 410 415

Gly Thr Pro Glu Asn Cys Gln Asn Glu Cys Cys Asp Ala Ala Thr Cys
420 425 430

Lys Leu Lys Ser Gly Ser Gln Cys Gly His Gly Asp Cys Cys Glu Gln
435 440 445

Cys Lys Phe Ser Lys Ser Gly Thr Glu Cys Arg Ala Ser Met Glu Cys
450 455 460

Asp Pro Ala Glu His Cys Thr Gly Gln Ser Ser Glu Cys Pro Ala Asp
465 470 475 480

Val Phe His Lys Asn Gly Gln Pro Cys Leu Asp Asn Tyr Gly Tyr Cys
485 490 495

Tyr Asn Gly Asn Cys Pro Ile Met Tyr His Gln Cys Tyr Asp Leu Phe
500 505 510

Gly Ala Asp Val Tyr Glu Ala Glu Asp Ser Cys Phe Glu Arg Asn Gln
515 520 525

Lys Gly Asn Tyr Tyr Gly Tyr Cys Arg Lys Glu Asn Gly Asn Lys Ile
530 535 540

Pro Cys Ala Pro Glu Asp Val Lys Cys Gly Arg Leu Tyr Cys Lys Asp
545 550 555 560

Asn Ser Pro Gly Asn Asn Pro Cys Lys Met Glu Tyr Ser Asn Glu Asp

565

570

575

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595 600 605

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<212> PRT
<213> Bothrops jararaca

<400> 13

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20 25 30

Lys Asn Lys Gly Leu Phe Ser Lys Asp Tyr Ser Glu Ile His Tyr Ser
35 40 45

Pro Asp Gly Arg Glu Ile Thr Thr Tyr Pro Pro Val Glu Asp His Cys
50 55 60

Tyr Tyr His Gly Arg Ile Glu Asn Asp Ala Asp Ser Thr Ala Ser Ile
65 70 75 80

Ser Ala Cys Asn Gly Leu Lys Gly Tyr Phe Lys Leu Gln Arg Glu Thr
85 90 95

Tyr Phe Ile Glu Pro Leu Lys Leu Pro Asp Ser Glu Ala His Ala Val
100 105 110

Phe Lys Tyr Glu Asn Val Glu Lys Glu Asp Glu Ala Pro Lys Met Cys
115 120 125

Gly Val Thr Gln Asn Trp Lys Ser Tyr Glu Pro Ile Lys Lys Ala Ser
130 135 140

Gln Leu Ala Phe Thr Ala Glu Gln Gln Arg Tyr Asp Pro Tyr Lys Tyr
145 150 155 160

Ile Glu Phe Phe Val Val Val Asp Gln Gly Thr Val Thr Lys Asn Asn
165 170 175

Gly Asp Leu Asp Lys Ile Lys Ala Arg Met Tyr Glu Leu Ala Asn Ile
180 185 190

Val Asn Glu Ile Phe Arg Tyr Leu Tyr Met His Val Ala Leu Val Gly
195 200 205

Leu Glu Ile Trp Ser Asn Gly Asp Lys Ile Thr Val Lys Pro Asp Val
210 215 220

Asp Tyr Thr Leu Asn Ser Phe Ala Glu Trp Arg Lys Thr Asp Leu Leu
225 230 235 240

Thr Arg Lys Lys His Asp Asn Ala Gln Leu Leu Thr Ala Ile Asp Phe
245 250 255

Asn Gly Pro Thr Ile Phe Tyr Ala Tyr Ile Gly Ser Met Cys His Pro
260 265 270

Lys Arg Ser Val Gly Ile Val Gln Asp Tyr Ser Pro Ile Asn Leu Val
275 280 285

Val Ala Val Ile Met Ala His Glu Met Gly His Asn Leu Gly Ile His
290 295 300

His Asp Thr Gly Ser Cys Ser Cys Gly Asp Tyr Pro Cys Ile Met Gly
305 310 315 320

Pro Thr Ile Ser Asn Glu Pro Ser Lys Phe Phe Ser Asn Cys Ser Tyr
325 330 335

Ile Gln Cys Trp Asp Phe Ile Met Asn His Asn Pro Glu Cys Ile Ile
340 345 350

Asn Glu Pro Leu Gly Thr Asp Ile Ile Ser Pro Pro Val Cys Gly Asn
355 360 365

Glu Leu Leu Glu Val Gly Glu Glu Cys Asp Cys Gly Thr Pro Glu Asn
370 375 380

Cys Gln Asn Glu Cys Cys Asp Ala Ala Thr Cys Lys Leu Lys Ser Gly
385 390 395 400

Ser Gln Cys Gly His Gly Asp Cys Cys Glu Gln Cys Lys Phe Ser Lys
405 410 415

Ser Gly Thr Glu Cys Arg Ala Ser Met Ser Glu Cys Asp Pro Ala Glu
420 425 430

His Cys Thr Gly Gln Ser Ser Glu Cys Pro Ala Asp Val Phe His Lys
435 440 445

Asn Gly Gln Pro Cys Leu Asp Asn Tyr Gly Tyr Cys Tyr Asn Gly Asn
450 455 460

Cys Pro Ile Met Tyr His Gln Cys Tyr Ala Leu Phe Gly Ala Asp Val
465 470 475 480

Tyr Glu Ala Glu Asp Ser Cys Phe Lys Asp Asn Gln Lys Gly Asn Tyr
485 490 495

Tyr Gly Tyr Cys Arg Lys Glu Asn Gly Lys Lys Ile Pro Cys Ala Pro
500 505 510

Glu Asp Val Lys Cys Gly Arg Leu Tyr Cys Lys Asp Asn Ser Pro Gly
515 520 525

Gln Asn Asn Pro Cys Lys Met Phe Tyr Ser Asn Asp Asp Glu His Lys
530 535 540

Gly Met Val Leu Pro Gly Thr Lys Cys Ala Asp Gly Lys Val Cys Ser
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Asn Gly His Cys Val Asp Val Ala Thr Ala Tyr
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<213> Crotalus atrox

<400> 14

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Val Ile Tyr Pro Arg Lys Val Thr Ala Leu Pro Lys Gly Ala Val Gln
35 40 45

Pro Lys Tyr Glu Asp Thr Met Gln Tyr Glu Leu Lys Val Asn Gly Glu
50 55 60

Pro Val Val Leu His Leu Glu Lys Asn Lys Gly Leu Phe Ser Lys Asp
65 70 75 80

Tyr Ser Glu Thr His Tyr Ser Phe Asp Gly Arg Lys Ile Thr Thr Asn
85 90 95

Pro Ser Val Glu Asp His Cys Tyr Tyr His Gly Arg Ile Glu Asn Asp
100 105 110

Ala Asp Ser Thr Ala Ser Ile Ser Ala Cys Asn Gly Leu Lys Gly His
115 120 125

Phe Lys Leu Gln Gly Glu Met Tyr Leu Ile Glu Pro Leu Lys Leu Ser
130 135 140

Asp Ser Glu Ala His Ala Val Phe Lys Leu Lys Asn Val Glu Lys Glu
145 150 155 160

Asp Glu Ala Pro Lys Met Cys Gly Val Thr Gln Asn Trp Glu Ser Tyr
165 170 175

Glu Pro Ile Lys Lys Ala Ser Asp Leu Asn Leu Asn Pro Glu His Gln
180 185 190

Arg Tyr Val Glu Leu Phe Ile Val Val Asp His Gly Met Tyr Thr Lys
195 200 205

Tyr Asn Gly Asp Ser Asp Lys Ile Arg Gln Arg Val His Gln Met Val
210 215 220

Asn Ile Met Lys Glu Ser Tyr Thr Tyr Met Tyr Ile Asp Ile Leu Leu
225 230 235 240

Ala Gly Ile Glu Ile Trp Ser Asn Gly Asp Leu Ile Asn Val Gln Pro
245 250 255

Ala Ser Pro Asn Thr Leu Asn Ser Phe Gly Glu Trp Arg Glu Thr Asp
260 265 270

Leu Leu Lys Arg Lys Ser His Asp Asn Ala Gln Leu Leu Thr Ser Ile
275 280 285

Ala Phe Asp Glu Gln Ile Ile Gly Arg Ala Tyr Ile Gly Gly Ile Cys
290 295 300

Asp Pro Lys Arg Ser Thr Gly Val Val Gln Asp His Ser Glu Ile Asn
305 310 315 320

Leu Arg Val Ala Val Thr Met Thr His Glu Leu Gly His Asn Leu Gly
325 330 335

Ile His His Asp Thr Asp Ser Cys Ser Cys Gly Gly Tyr Ser Cys Ile
340 345 350

Met Ser Pro Val Ile Ser Asp Glu Pro Ser Lys Tyr Phe Ser Asp Cys
355 360 365

Ser Tyr Ile Gln Cys Trp Glu Phe Ile Met Asn Gln Lys Pro Gln Cys
370 375 380

Ile Leu Lys Lys Pro Leu Arg Thr Asp Thr Val Ser Thr Pro Val Ser
385 390 395 400

Gly Asn Glu Leu Leu Glu Ala Gly Ile Glu Cys Asp Gly Gly Ser Leu
405 410 415

Glu Asn Pro Cys Cys Tyr Ala Thr Thr Cys Lys Met Arg Pro Gly Ser
420 425 430

Gln Cys Ala Glu Gly Leu Cys Cys Asp Gln Cys Arg Phe Met Lys Lys
435 440 445

Gly Thr Val Cys Arg Val Ser Met Val Asp Arg Asn Asp Asp Thr Cys
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<213> Artificial Sequence

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SEQUENCE LISTING

<110> Markland, Francis S.
Ritter, Matthew

<120> Contortrostatin (CN) and Methods for its Use In
Preventing Metastasis and Other Conditions

<130> USC/09801388/Markland et al

<140>
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<150> 09/460,295
<151> 1999-12-10

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aaaataaaagg actttttca aaagattaca gcgagactca ttattcctct gatggcagaa 360
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atgctgactc aactgcaagc atcagtgcattt gcaacgggtt gaaaggacat ttcaagcttc 480
aaggggagac gtaccttattt gaacccttga agctttccga cagtgaagcc catgcagtct 540
acaaatatga aaacgttagaa aaagaagatg aggccccaa aatgtgtggg gtaacccaga 600
ctaattggga atcagatgag cccatcaaaa aggcctctca gttaaatctt actcctgaac 660
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cggaaataccaa cggcaattta aatactatta gaatatgggt acatgaacctt gtcaacacta 780
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Gln	Gly	Ser	Ser	Ile	Ile	Leu	Glu	Ser	Gly	Asn	Val	Asn	Asp	Tyr	Glu
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Val	Leu	Tyr	Pro	Gln	Lys	Val	Thr	Ala	Leu	Pro	Lys	Gly	Ala	Val	Gln
								35						40	

Pro	Lys	Tyr	Glu	Asp	Thr	Met	Gln	Tyr	Glu	Phe	Lys	Val	Asn	Gly	Glu
								50						55	

Pro Val Val Leu His Leu Glu Lys Asn Lys Gly Leu Phe Ser Lys Asp

65

70

75

80

Tyr Ser Glu Thr His Tyr Ser Ser Asp		Gly Arg Lys Ile Thr Thr Asn	
85		90	95

Pro Pro Val Glu Asp His Cys Tyr Tyr		His Gly Arg Ile Gln Asn Asp
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Ala Asp Ser Thr Ala Ser Ile Ser Ala		Cys Asn Gly Leu Lys Gly His
115	120	125

Phe Lys Leu Gln Gly Glu Thr Tyr Leu		Ile Glu Pro Leu Lys Leu Ser
130	135	140

Asp Ser Glu Ala His Ala Val Tyr Lys		Tyr Glu Asn Val Glu Lys Glu	
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Asp Glu Ala Pro Lys Met Cys Gly Val		Thr Gln Thr Asn Trp Glu Ser	
165		170	175

Asp Glu Pro Ile Lys Lys Ala Ser Gln		Leu Asn Leu Thr Pro Glu Gln
180	185	190

Gln Gly Phe Pro Gln Arg Tyr Ile Glu		Leu Val Val Val Ala Asp His
195	200	205

Arg Met Phe Thr Lys Tyr Asn Gly Asn		Leu Asn Thr Ile Arg Ile Trp
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Val His Glu Leu Val Asn Thr Met Asn		Val Phe Tyr Arg Pro Leu Asn	
225	230	235	240

Ile Arg Val Ser Leu Thr Asp Leu Glu		Val Trp Ser Asp Gln Asp Leu	
245		250	255

Ile Asn Val Gln Pro Ala Ala Ala Asp		Thr Leu Glu Ala Phe Gly Asp
260	265	270

Trp Arg Glu Thr Val Leu Leu Asn Arg		Ile Ser His Asp Asn Ala Gln
275	280	285

Leu Leu Thr Ala Ile Glu Leu Asp Gly		Glu Thr Ile Gly Leu Ala Asn
290	295	300

Arg Gly Thr Met Cys Asp Pro Lys Leu		Ser Thr Gly Ile Val Gln Asp	
305	310	315	320

His Ser Ala Ile Asn Leu Trp Val Ala		Val Thr Met Ala His Glu Met
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Gly His Asn Leu Gly Ile Ser His Asp		
340	345	350
Ala Asn Ser Cys Ile Met Ser Glu Glu		
355	360	365
Glu Phe Ser Asp Cys Ser Gln Asn Gln		
370	375	380
His Asn Pro Gln Cys Met Leu Asn Glu		
385	390	395
Ser Thr Pro Val Ser Gly Asn Glu Leu		
405	410	415
Asp Phe Asp Ala Pro Ala Asn Pro Cys		
420	425	430
Leu Thr Thr Gly Ser Gln Cys Ala Asp		
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Lys Phe Met Lys Glu Gly Thr Val Cys		
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